

Description of Additional Supplementary Files

File Name: Supplementary Movie 1

Description: Distribution of methylene-stained sensory neurons in the hindwing veins of *Vanessa cardui*. Note that in these images, the membranes of the wing are white saturated.

File Name: Supplementary Movie 2

Description: Distribution of methylene-stained sensory neurons in the forewing veins of *Satyrrium caryaevorus*.

File Name: Supplementary Movie 3

Description: Tidal flow of hemolymph in a radial vein of *Vanessa cardui*.

File Name: Supplementary Movie 4

Description: Hemolymph flow (with hemocytes highlighted) within the scent pad of *Parrhasius malbum*, and the beating of wing heart.

File Name: Supplementary Movie 5

Description: Hemolymph flow within the scent pad of *Parrhasius m-album*, and the beating of wing heart.

File Name: Supplementary Movie 6

Description: Hemolymph flow (with hemocytes highlighted) within the scent pad of *Satyrrium caryaevorus*.

File Name: Supplementary Movie 7

Description: Hemolymph flow within the scent pad of *Satyrrium caryaevorus*.

File Name: Supplementary Movie 8

Description: Thermal camera video of a number of species of butterflies during laser-induced local heating experiments.

File Name: Supplementary Movie 9

Description: Visible and thermal camera videos taken during laser-induced local heating experiments with *Parrhasius m-album*. The laser spot focused on the butterfly was produced by a telecom laser at $\lambda=1.55\ \mu\text{m}$

File Name: Supplementary Movie 10

Description: Visible camera videos taken during basking experiments with *Satyrrium caryaevorus* at low and high ambient temperatures.

File Name: Supplementary Movie 11

Description: Visible camera videos taken during basking experiments with *Parrhasius m-album* at low and high ambient temperatures.

File Name: Supplementary Movie 12

Description: Visible camera video taken in the field to show that adults of *Satyrrium caryaevorus* almost always bask in the sun within a few seconds after landing.

